

Earth's Dynamic Geosphere Earthquake Storylines

Below are storylines that were designed by Cheryl Mosier, an Earth Science Teacher at Columbine High School in Littleton, Colorado.

Big Idea:

5. The dynamic geosphere includes a rocky exterior upon which ecosystems and human communities developed and a partially molten interior with convection circulation that generates the magnetosphere and drives plate tectonics. It contains resources that sustain life, causes natural hazards that may threaten life, and affects all of Earth's other geospheres.
9. Natural hazards associated with Earth processes and events include drought, floods, storms, volcanic activity, earthquakes and climate change. They pose risks to humans, their property and communities. Earth science is used to study, predict, and mitigate natural hazards so that we can assess risks, plan wisely, and acclimate to the effects of natural hazards.

	Activity 1 – An Earthquake in Your Community	Activity 2 – Detecting Earthquake Waves	Activity 3 – How Big Was It?	Activity 4 – Earthquake History of Your Community	Activity 5 – Lessening Earthquake Damage	Activity 6 – Designing “Earthquake-Proof” Structures
Key Evidence Learned	- P and S and surface waves and their characteristics - epicenter and focus	- how seismometers work - how to read a seismometer - how to interpret a travel-time graph	- develop an intensity scale - map intensity of an EQ - magnitude - amplification & liquefaction	- global EQ distribution patterns - correlations between faults and EQ locations	- direct and indirect hazards	- safe building construction - resonance
Connection to:			- epicenter location - comparison of magnitude and intensity	- risk areas in the US	- personal safety during and after an EQ	- how to mitigate damage
Big Idea	- how the movement of P, S and surface waves affect the Earth's surface and cause damage	- how to determine the distance to the EQ	- understand intensity vs. magnitude - how liquefaction and amplification can cause damage	- where EQ occur on Earth - high risk areas of the US	- how to mitigate damage - safety before, during and after and EQ	- how to mitigate damage from EQ - how to build safer buildings

Real Life and Chapter Challenge	- how seismic waves affect people and buildings	- how to know how far away an EQ was	- difference between intensity and magnitude - how liquefaction and amplification affect people and buildings	- closest EQ and faults to <STATE> - our risk rating for <STATE>	-what to expect during and after an EQ - personal safety during and after an EQ	- how to mitigate damage - building codes
Geosphere	- seismic waves and their interaction with the surface - faults	- how waves travel through the Earth	- measurement of magnitude - location of epicenter - amplification and liquefaction	- patterns of EQ in relation to plate boundaries - where faults occur	- hazards from EQ – how they are caused	- resonance - damage mitigation through surface construction
Hydrosphere	- how seismic waves affect water - tsunamis	- how waves change when they move through water	- tsunamis	- where earthquakes occur in the ocean	- tsunamis	- how to mitigate damage near lakes and the ocean
Atmosphere						
Cryosphere	- what could happen to a glacier from a seismic wave		- how ice reacts	- EQ near glaciated areas		
Biosphere	- affect of seismic waves on trees and people		- difference between intensity and magnitude	- risk ratings	- personal safety - how hazards affect humans	- damage mitigation

- epicenter location